# TECHNICAL REVIEW DOCUMENT for OPERATING PERMIT 950PPB068

to be issued to:

Colorado Mental Health Institute at Pueblo (CMHIP)
Pueblo County
Source ID 1010006

Prepared on December 26, 1996
Revised on January 28, 1997, February 14, 1997 and May 9, 1997
Jacqueline Joyce, Review Engineer

### I. Purpose:

This document will establish the basis for decisions made regarding the Applicable Requirements, Emission Factors, Monitoring Plan and Compliance Status of Emission Units covered within the Operating Permit proposed for this site. It is designed for reference during review of the proposed permit by the EPA and during Public Comment. The conclusions made in this report are based on information provided in the original application submittal of November 15, 1995, additional submittals of December 28, 1995 and December 24, 1996, a May 7, 1997 meeting and telephone conversations with the source.

### II. Source Description:

This source is classified as a psychiatric hospital under Standard Industrial Classification 8063. This facility is a psychiatric hospital with the following specific emission units: 2 coal-fired boilers, 2 natural gas-fired back-up boilers and a pathological waste incinerator. This facility is located at 1600 West 24th Street in Pueblo. Pueblo is a fairly large community with a population of approximately 100,000. This facility is located in an area designated as attainment for all criteria pollutants and there are no affected states within 50 miles. The Great Sand Dunes Wilderness Area, a Federal Class I designated area, is within 100 km of this facility. With respect to Prevention of Significant Deterioration (PSD) requirements, this facility is considered a minor source with emissions as follows:

<u>Pollutant</u>	Potential to Emit (tpy)	Actuals (tpy)
PM	10	2.7
PM <sub>10</sub>	4.2	1.7
SO <sub>2</sub>	111.4	97.8
NO <sub>x</sub>	156.7	50.8
CO	48.9	30.2
VOC	3.1	0.4

The potential to emit for the coal-fired boilers is the emission limits identified in construction permit 86PB240-1. The potential to emit for the gas-fired boilers and the pathological incinerator is based on these units operating at maximum design capacity for 8760 hours. Actual emissions are based on the latest Air Pollution Emission Notice

(APEN) submitted for each piece of equipment, which were submitted to the Division in January 1993. The source indicated that they are not subject to 112(r), the Accidental Release Requirements.

An emission reduction credit (86PB239R) had been previously issued for this facility in January 1987. This credit expired in January 1994 and is no longer available for use.

#### III. Emission Sources:

The following sources are specifically regulated under terms and conditions for the Operating Permit for this Site.

- A. Unit 007: Two Babcock and Wilcox Tower Pak Boilers (#s 1 & 2), coal-fired, serial numbers 757901 and 757902 (construction permit 86PB240-1)
  - 1. Applicable Requirements These units are covered under construction permit 86PB240-1. This permit is an initial approval dated January 23, 1987. These boilers were moved to final approval status as the stack testing requirements and a final approval inspection had been performed in 1989. Although final approval was recommended in 1989, final approval was never officially granted and a final approval construction permit was never issued. Because the Operating Permit is expected to be issued soon, a final approval construction permit will not be issued. The pertinent applicable requirements from this permit are as follows:
  - a. Opacity (condition 1)

    Visible emissions not to exceed 20% opacity
  - b. Emission limits (condition 5)

Particulate Matter: 5.7 lbs/hr 7.8 tons/yr\* and Sulfur Dioxide: 77.9 lbs/hr and 107.1 tons/yr Nitrogen Oxides: 59.8 lbs/hr and 82.2 tons/yr\* Volatile Organic Compounds: 0.3 lbs/hr and 0.4 tons/vr Carbon Monoxide: 30.0 tons/yr 21.8 lbs/hr and

c. Fuel consumption (condition 6)

Coal: 8,726 lbs/hr and 12,000 tons/yr\*

- \* In the construction permit fuel consumption requirements were worded incorrectly to specify the hourly limit "or" the annual limit. In the draft Operating Permit the language was corrected to specify the hourly limit "and" the annual limit.
- d. New Source Performance Standards (NSPS) as stated in Reg 6, Part B.II (condition 9)

Sulfur dioxide: 1.2 lbs/million Btu heat input

<sup>\*</sup> The emissions for Particulate Matter and Nitrogen Oxide were increased due to an emission factor change (previously Particulate Matter emissions were 1.7 lbs/hr and 2.3 tons/yr and Nitrogen Oxide emissions were 40.3 lbs/hr and 55.8 tons/yr). This change was made directly into the Operating Permit as no additional applicable requirements were triggered.

Particulates:  $0.5(FI)^{-0.26}$ ; where FI = Fuel input in mmBtu/hr\*

\* The construction permit provided an actual number for the particulate limit. However, in the draft Operating Permit the requirement was put in as an equation which is how the requirement appears in the regulation.

These NSPS requirements (Colorado Regulation 6, Part B, Section II) are State only. However, since the sulfur dioxide and particulate standards are also found in Colorado Regulation No. 1 (sulfur dioxide - Section VI.B.4.a.(ii) and particulates - Section III.A.1.b), which is part of the EPA approved State Implementation Plan (SIP), the NSPS requirements are both State and Federally enforceable.

e. Emission control equipment shall be maintained in accordance with the manufacturer's instructions to achieve a continuous control efficiency of at least 98% for particulates (condition 7).

As it is difficult to quantify control equipment efficiency, this condition appears in the draft Operating Permit as a "controlled" emission factor and not as a control device efficiency.

In addition, these additional specific applicable requirements are included in the draft Operating Permit.

- 30 % Opacity under any of the following conditions: fire building, cleaning
  of fire boxes, soot blowing, start-up, process modifications or adjustment
  of control equipment (Reg 1, Section II.A.4)
- **2. Emissions Factors -** The emissions from the boiler are generated from the combustion of coal. The pollutants of concern are Particulate Matter (PM and PM<sub>10</sub>), Nitrogen Oxides (NO<sub>x</sub>), Sulfur Dioxide (SO<sub>2</sub>), Carbon Monoxide (CO) and Volatile Organic Compounds (VOC). The source did not identify the emission factors to be used to verify compliance with emission limits. Therefore, the Division will require the use of emission factors from EPA's Compilation of Air Pollutant Emission Factors (AP-42), dated January 1995, Section 1.1 (coal combustion), for spreader stoker boilers:

<u>Pollutant</u>	Emission Factor (lbs/ton)
PM	66
PM <sub>10</sub>	13.2
SO <sub>2</sub>	35S
$NO_x$	13.7
VOC	0.05
CO	5

The "S" identified in the emission factor is the weight percent sulfur in the fuel.

The emission factors for PM and PM<sub>10</sub> will be adjusted in the operating permit by multiplying the AP-42 factors by 0.02 to account for the control equipment.

**3. Monitoring Plan -** Conditions 3.1 through 3.10 identify how the source will be required to determine compliance with requirements.

In addition to monitoring monthly fuel use and sampling fuel for weight percent sulfur and ash and heating value, the source will be required to calculate monthly emissions.

Compliance with the NSPS particulate matter and sulfur dioxide limits can be demonstrated solely by sampling of coal unless heating value and/or weight percent sulfur deviate from certain defined values, which would require calculations to determine compliance status.

The boilers are equipped with a continuous opacity monitor (COM) which alarms at 20% opacity. There is no regulatory requirement for these units to have COMs and this COM has not been certified by the Division; therefore, the Division will not require the COM to be used to demonstrate compliance or noncompliance. Compliance with opacity requirements will be demonstrated by performing a visual emissions observation, in accordance with EPA reference method 9. Anytime the COM alarms the source will be required to document the reason for the alarm and any corrective action taken.

A stack test was performed on these units in 1987 and compliance with the particulate matter emission limits was demonstrated. The Division believes that with the use of the COM to identify potential baghouse problems and an effective preventative maintenance program the efficiency of the baghouse can be adequately monitored without requiring additional stack testing for these units. The source will be required to maintain records of baghouse inspections and maintenance schedules.

**4. Compliance Status -** The source certified in the Title V permit application that the coal boilers were in compliance with all applicable requirements. The facility was inspected on March 28, 1996 and the inspector found that operation of the boilers was in compliance with the conditions of permit 86PB240-1.

# B. Unit 010 Coal Stockpile and Handling System, no serial number (construction permit 86PB240-2)

As part of the additional information submitted December 24, 1996, the source requested that the construction permit (86PB240-2) for this unit be cancelled as the uncontrolled actual emissions from the coal stockpiling and handling were less than APEN de minimis levels and therefore do not require a construction permit. The coal stockpile and handling is identified in the draft Operating Permit as an insignificant activity. However, as insignificant activities, this source is still required to comply with the General Conditions of the permit, which include requirements for fugitive particulate emissions.

# C. Unit 011, Ash Handling System, Detroit Pheumatic Conveying System, serial number CV-394-P (construction permit 86PB240-3)

As part of the additional information submitted December 24, 1996, the source requested that the construction permit (86PB240-3) for this unit be cancelled as the uncontrolled actual emissions from the ash handling system were less than APEN de minimis levels and therefore do not require a construction permit. The ash handling system is identified in the draft Operating Permit as an insignificant activity. However, as insignificant activities, this source is still required to comply with the General Conditions of the permit.

# D. Units 004 & 006, Natural Gas- Fired Boilers (#4 & #3), Cleaver Brooks model DL-52, serial numbers WL-1602 and WL-1319, (grandfathered sources)

**1. Applicable Requirements -** These units were placed into service in 1970 and are therefore considered "grandfathered" sources. The applicable requirements for these units are as follows:

- 20 % Opacity (Reg 1, Section II.A.1)
- Particulates PE = 0.5(FI)<sup>-0.26</sup> (Reg 1, Section III.A.1.b)
   Where FI = heat input, in mmBtu/hr
   PE = particulate emissions limit in lbs/mmBtu
- **2. Emission Factors -** Emissions from these units are from combustion of the fuel and are dependent on the fuels being burned. The pollutants of concern are Particulate Matter (PM and PM<sub>10</sub>), Nitrogen Oxides (NO<sub>x</sub>), Sulfur Dioxide (SO<sub>2</sub>), Carbon Monoxide (CO) and Volatile Organic Compounds (VOC). Approval of emission factors for these units are necessary to the extent that accurate actual emissions are required to verify the need to submit revised APENs to update the Division's Emission Inventory and for the payment of fees. The source did not identify the emission factors to be used to calculate annual emissions. Therefore, the Division will require the use of emission factors from EPA's Compilation of Air Pollutant Emission Factors (AP-42), dated January 1995, Section 1.4 (natural gas combustion) for small industrial boilers. The VOC and PM<sub>10</sub> emission factors are from EPA's FIRE Version 5.0 Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants (EPA-454/R-95-012), dated August 1995 (SCC 1-03-006-02).

<u>Pollutant</u>	Emission Factor (Natural Gas)	
PM	13.7 lbs/mmCF	
$PM_{10}$	3.0 lbs/mmCF	
SO <sub>2</sub>	0.6 lbs/mmCF	
NO <sub>x</sub>	140 lbs/mmCF	
VOĈ	2.8 lbs/mmCF	
CO	35 lbs/mmCF	

The "S" identified in the emission factor is the percent sulfur in the fuel.

- **3. Monitoring Plan -** Source does not identify any specific monitoring plan because the boilers are operated as stand-by units. However, the Division will require that compliance with applicable requirements be demonstrated when the units are operated. Conditions 1.1 through 1.4 identify how the source will be required to determine compliance with requirements. Monitoring requirements consist of maintaining records of annual fuel useage and an annual emissions calculation. Compliance with opacity and particulate requirements are presumed through exculsive use of natural gas.
- **4. Compliance Status -** The source is currently in compliance with all applicable requirements.
- E. Unit 012, Shenandoah Pathological Waste Incinerator, serial number P16-20T (construction permit 89PB061I)
  - **1. Applicable Requirements -** This unit is covered under construction permit 89PB061I. This permit is a final approval permit dated August 2, 1990. The pertinent applicable requirements from this permit are as follows:
  - a. Source must comply with NSPS for Incinerators, Regulation 6, Part B, Section VII (condition 1) which identifies the following specific requirements.
    - i) opacity is not to exceed 20%

- ii) particulate emissions are not to exceed 0.10 grains/dry standard cubic foot corrected at 12% CO<sub>2</sub>
- iii) summarized monthly records of daily burning rates and hours of operation and any particulate emission measurements shall be kept for 5 years.

The permit actually cited the NSPS requirements as Regulation 6, Section III. But revisions of Regulation 6 have changed the numbering of the requirement although the requirements are the same except for item (iii). The revised NSPS requirement requires daily recording of charge rates and hours of operation but does not specify a time period for retaining records. Since Title V requires that records be kept for 5 years (Regulation 3, Part C, Section V.C.6) the more stringent recordkeeping period has been included in the draft Operating Permit. This unit does not have to comply with the requirements of biomedical waste incinerators (Colorado Regulation 6 Part B Section V) because construction was begun prior to August 30, 1989 and because its capacity is less than 200 lbs/hr (Colorado Regulation No. 1, Section III.B.4).

These NSPS requirements (Colorado Regulation 6, Part B, Section VII) are State only requirements. However, the opacity and particulate requirements are both found in Colorado Regulation 1 (opacity - Section II.A.1 and particulate - Section III.B.4.b) which is part of the EPA approved SIP. Therefore, the NSPS requirements are both State and Federally enforceable.

b. Charging rate is not to exceed 60 lbs/hr with a heat content of 1,000 Btu/lb. Operation of the unit will have a maximum heat release rate of 60,000 Btu/hr (condition 2).

The heat content of the waste is dependent on the type of waste burned and this incinerator was permitted for type 4 waste only, which has a heat content of 1,000 Btu/lb.

c. Secondary combustion chamber shall be preheated to the temperature specified in the manufacturer's operating instructions and must be maintained at this temperature until the incineration cycle is complete. Auxiliary burners shall be capable of providing these temperatures without the assistance of the heat content of the waste. Automatic controls shall not be overriden during operation (condition 3).

In a request for additional information the source indicated that the secondary combustion chamber should be pre-heated to 1300° F in order to ensure that temperatures in the combustion chamber are between 1400 - 1800° F when waste is burned. Therefore in the operating permit the requirement will be modified to state that secondary combustion chamber shall be pre-heated to 1300° F and during the burn temperatures should range between 1400 - 1800° F.

- d. Source shall comply with Regulation 2 odor (condition 5).
- e. There will be no radioactive and hazardous waste materials of any type burned in the incinerator unless the unit has been issued a permit to dispose of such wastes (condition 6).
- f. The unit shall only be operated by personnel who are competent and knowledgeable of the incinerator's operating and maintenance procedures (condition 7).
- **2. Emission Factors -** Permit 89PB061I does not provide emission limitations on the source with the exception of particulates. Although emissions are low for this unit, there are no emission de minimis levels for either APEN or permitting requirements (Colorado

Regulation 3 Part A Section II.D.2 and Regulation 3 Part B Section III.D.7) for incinerators. As a result annual emission calculations will be required. The pollutants of concern are Particulate Matter (PM and PM<sub>10</sub>), Nitrogen Oxides (NO<sub>x</sub>), Sulfur Dioxide (SO<sub>2</sub>), Carbon Monoxide (CO) and Volatile Organic Compounds (VOC) and are dependent on the material combusted (i.e. waste material or fuel). Approval of emission factors is necessary to the extent that accurate actual emissions are required to verify the need to submit revised APENs to update the Division's Emission Inventory and for payment of fees. The source did not identify the emission factors to be used to calculate annual emissions. Therefore, the Division will require the use of emission factors from EPA's FIRE Version 5.0 Source Classification Codes and Emission Factor Listing for Criteria Air Pollutants (EPA-454/R-95-012), dated August 1995 (SCC 1-03-005-01 (for fuel burning) and SCC 5-02-005-05 (for waste burning)):

<u>Pollutant</u>	Emission Factor (Fuel)	Emission Factor (Waste)
PM	2 lbs/10³ gal	4.67 lbs/ton
$PM_{10}$	1.08 lbs/10 <sup>3</sup> gal	5.92 lbs/ton
SO <sub>2</sub>	143 lbs/10 <sup>3</sup> gal	7.50 lbs/ton
NO <sub>x</sub>	20 lbs/10 <sup>3</sup> gal	3.50 lbs/ton
VOĈ	0.34 lbs/10 <sup>3</sup> gal	10.2 lbs/ton
CO	5 lbs/10³ gal	2.95 lbs/ton

**3. Monitoring Plan -** Source indicates they will maintain records for each burn. An inspection report (4/6/95) indicates that the following information is recorded: date and time, type of waste and generation location, weight of charge, initials of operator and any notes regarding incinerator operation.

Conditions 4.1 through 4.10 identify how the source will be required to determine compliance with requirements. In addition to maintaining the records indicated above the source will be required to calculate emissions annually, which requires keeping annual records of fuel used and waste burned, maintain records of personnel certified to operate the incinerator and perform visual emission observations, in accordance with EPA reference method 9.

**4. Compliance Status -** The source certified that they were in compliance with all applicable requirements. The information in the Title V permit application did not clearly support the certification of compliance and the incinerator was not included in the most recent inspection performed (March 28, 1996) at this facility. The source was asked to provide additional information to verify compliance with the applicable requirements. This additional information submitted on December 24, 1996 indicated that this unit was in compliance with all applicable requirements.

#### IV. Insignificant Activities:

General categories of insignificant activities include chemical storage tanks or containers that hold less than 500 gallons and have a daily throughput less than 25 gallons and landscaping and site housekeeping devices equal to or less than 10 hp in size (i.e. lawnmowers, trimmers, snow blowers, etc.). Specific insignificant activities identified in the permit application include:

Sources with emissions less than APEN de minimis (Reg 3 Part C.II.E.3.a)

Coal Stockpile and Handling (formerly permit 86PB240-2) Ash Handling System (formerly permit 86PB240-3)

#### Chemical Storage Tanks/Containers (Reg 3 Part C.II.E.3.n)

- 3 400-gal. Tanks for water treatment chemicals in the boiler plant
- 1 55-gal. Drum for water treatment chemical in the boiler plant
- 1 55-gal. Drum for water treatment chemical in building 118
- 4 55-gal. Drums for cooling tower water treatment chemical in buildings 020, 118, 121 and 125

### Landscaping and Housekeeping Devices (Reg 3 Part C.II.E.3.bb)

- 4 Gasoline powered lawn mowers
- 4 Gasoline powered trimmers
- 2 Gasoline powered snow blowers

### Storage of butane, propane or LPG in tanks less than 60,000 gal (Reg 3 Part C.II.E.3.zz)

1 Propane storage tank at Building 117 (500 gal)

## Fuel storage and dispensing equipment less than 400 gal/day cap. (Reg 3 Part C.II.E.3.ccc)

- 1 Diesel fuel storage tank (1,000 gal)
- 1 Unleaded gasoline storage tank (2,000 gal)

# Storage tanks with annual throughput less than 400,000 gal and restricted contents (Reg 3 Part C.II.E.3.fff)

- 1 Diesel fuel storage tank at Bldg 035 (1,000 gal, underground)
- 1 Diesel fuel storage tank at Bldg 008 (250 gal, aboveground)
- 1 Diesel fuel storage tank at Bldg 126 (100 gal, underground)
- 1 Diesel fuel storage tank at Bldg 118 (550 gal, underground)
- 1 Diesel fuel storage tank at Bldg 106 (295 gal, underground)
- 1 Diesel fuel storage tank at Bldg 020 (1,000 gal, aboveground)
- 1 Diesel fuel storage tank at Bldg 125 (2,000 gal, aboveground)
- 1 Diesel fuel storage tank at Bldg 120 (500 gal, aboveground)
- 1 Diesel fuel storage tank at Bldg 055 (55 gal, aboveground)
- 1 Diesel fuel storage tank at Bldg 130 (55 gal, aboveground)

#### Stationary Internal Combustion Engines (Reg 3 Part C.II.E.3.nnn)

10 Stationary diesel engines for emergency generators at buildings 008, 020, 035, 055, 106, 118, 120, 125, 126, and 130

### V. Alternate Operating Scenarios:

No alternative operating scenarios have been identified.

#### VI. Permit Shield

The source did not request the permit shield for specific nonapplicable requirements; however, the Division thought it would be prudent to provide the shield for the following nonapplicable requirements:

- A. 40 CFR Part 60 Subpart Db (as adopted by reference in Colorado Regulation 6) These NSPS requirements are not applicable because each individual boiler has a maximum heat input capacity of less than 100 mmBtu/hr.
- B. 40 CFR Part 60 Subpart Dc (as adopted by reference in Colorado Regulation 6) These NSPS requirements are not applicable because the boilers commenced construction, modification, or reconstruction prior to June 9, 1989.